CHAPTER 18 - FISHING MASTER, FIRST-CLASS

PART I - GENERAL REQUIREMENTS OF APPLICANTS

18.1 Every applicant for a certificate as a Fishing Master, First-Class, shall:

(a) complete 12 months service as officer in charge of the watch after obtaining a certificate as Fishing Master, Second-Class, or Watchkeeping Mate, Ship, on a ship of not less than 25 tons gross tonnage engaged on voyages beyond partially smooth water limits;

(b) obtain a medical certificate prescribed by the Crewing Regulations;

(c) obtain a Restricted Operator Certificate with Maritime Commercial Qualifications (ROC-MC) issued by Industry Canada;

(d) obtain a certificate of completion for each of the following courses from a school listed in TP 10655:

(i) Marine Emergency Duties Course, set out in TP 4957:

(A) for Officers (C); and
(B) for Senior Officers (D);

(ii) Simulated Electronic Navigation Course Level II, set out in TP 4958;

(iii) Marine First Aid Advanced Course, set out in TP 13008;

(e) pass an examination in each of the following subjects:

(i) Navigation;
(ii) Meteorology;
(iii) General Ship Knowledge including Engineering Knowledge; and
(iv) Navigation Safety;
(v) Ship Stability

(f) pass a practical examination in Simulated Electronic Navigation Level II; and

(g) pass an oral examination in General Seamanship.

PART II - EXAMINATIONS

18.2 The following table lists the examinations for the Fishing Master, First-Class, Certificate, the qualifying service required before each may be attempted, and other requirements. The examinations listed in chapter 19 must also have been passed.

Examination	Qualifying Watchkeeping Service While Holding Certificate	Other Requirements
SIM 2 Chartwork and Pilotage	Nil	Must have completed SIM 1.
050 Navigation	Nil	Must have completed 18 months sea service.
062 Navigation Safety	12 months	Must hold WKMS or FC II.
073 Meteorology	Nil	Must hold WKMS or FC II.
111 Ship Stability	Nil	Must hold WKMS or FC II.
158 General Ship Knowledge including Eng. Knowledge	Nil	Must hold WKMS or FC II.
169 General Seamanship	12 months	The applicant must have passed all other examinations before attempting 169.

PART III - VALIDITY OF CERTIFICATE

18.3 The certificate as Fishing Master, First-Class, is valid as master of a fishing vessel without restriction.

PART IV - SYLLABUSES OF EXAMINATIONS

18.4 Not in use.

18.5 Chartwork and Pilotage
SIMULATED ELECTRONIC NAVIGATION
Examination number SIM 2
Companion to Sections 11.6 and 14.5

ITEM	COLUMN
1.	The syllabus of the examination is presented in TP 4958, Simulated Electronic Navigation Courses.
2.	Passage Preparation To be completed ahead of simulator examination.
3.	Simulator Exercise (Duration Two Hours) Includes items 2, 3, and 4; passage about 20 nautical miles; parallel indexing, including wheel over; complex collision avoidance; course alteration for navigational purposes; all available electronic navigation.
4.	Navigator Note Book Navigator notebook to include chart number and courses for voyage, course alteration and wheel over positions, position of danger areas in the proximity of the intended track, traffic CIPs and distance to next CIP; position where a change of machinery status will be required; parallel indexing information or information on the elements used to construct an ARPA graphic map; radar datum chosen for P.I; time of HW/LW and information on tidal currents; pilotage information, if applicable; total distance and steaming time at proposed speed.
5.	Manoeuvre a Ship Manoeuvring a ship stopping anchoring.
6.	Emergencies Emergencies may be introduced, but not at a critical moment during the exercise.

Note: The examination consists of simulated exercises conducted by Marine Safety.
Time for passage planning to be one and a half to three hours.
Duration is three and a half to five hours.

18.6 Navigation
Examination number 050

ITEM	COLUMN
1.	Basic Basic nautical astronomy, shape of the earth, poles, latitude, longitude; celestial sphere structure; solar system, including relative movement of bodies; hour angles; time, units of time; time keeping; rising and setting of sun and twilight times.
2.	Calculations Correction of sextant altitudes and understanding of applied corrections; care and knowledge of sextant and sextant errors; application of *Nautical Almanac*; calculation of distance/speed from engine revolutions; circle of position and use of position line.
3.	Charts Principles of construction of Mercator, polyconic and gnomonic charts and their use.
4.	Plane and Mercator Sailing Plane and Mercator sailing and application of traverse tables; determining great circle courses and distances by HO 229.
5.	Astro Sights Latitude by meridian altitude of sun, and stars, including Polaris; latitude and position line by ex-meridian altitude of the sun; longitude and position line by sun and/or stars; finding position by two observations of heavenly bodies simultaneously or separately by a run (sun and/or stars only); combination of celestial and terrestrial observations.

Note: The examination consists of:
(a) practical navigation calculations; and
(b) a multiple-choice test on basic principles of the subject.
Duration is three hours.

18.7 Navigation Safety

Examination number 061

Companion to Sections 13.12, 16.19, 19.8, 20.8 and 21.7

ITEM	COLUMN
1.	Navigation Safety Application of the content of Collision Regulations with Canadian Modifications 1983; STCW Code section A-VIII/2.

Note: The examination is a multiple-choice test, supplemented by oral questions as necessary. Duration is one and a half hours.

18.8 Meteorology

Examination number 073

Companion to Section 11.12, 14.6, 19.9 and 20.10

ITEM	COLUMN
1.	Chemical Composition of the Atmosphere Water vapour, nitrogen, oxygen, argon, carbon dioxide, krypton, xenon, ozone; dust and hygroscopic particles, dust, smoke, salt particles; micro-organisms (such as bacteria used as nuclei for artificial snow).
2.	Vertical Structure Troposphere, stratosphere, mesosphere, thermosphere and ionosphere; stratospheric clouds, nacreous and noctilucent, appearance, height limits, composition; optical phenomena, reflection, refraction, aureole, bishop's ring, corona, halo, mock sun or parhelion, rainbow, mirages, Saint Elmo's fire, northern lights, magnetic storms, phosphorescence.
3.	Transfer of Heat Radiation, conduction, convection, turbulence.
4.	Temperature Related to the atmosphere and the earth; calorie, specific heat of water and earth; perpendicular and oblique radiation; selective absorption of radiation by the atmosphere; isotherm; temperature and distance of the sun.
5.	Atmospheric Moisture and Changes of State Heat of fusion, vaporization and sublimation; latent heat; relative and absolute humidity, saturation, supersaturation and supercooling, dew point; lapse rates, adiabatic cooling, dry and saturated lapse rates.
6.	Atmospheric Stability Stability, instability, conditional instability, potential instability; causes of inversions, radiative cooling, turbulence or convection, subsidence; effects of inversions, fog and low-lying cloud, smog, accumulation of smoke, causes of subsidence, effect of substances, compression heating, evaporation.
7.	Fog Definition, formation; season, locality and frequency of occurrence; major types, advection, radiation, frontal, sea smoke; anomalous propagation of sound in fog, mist, haze, smog.
8.	Clouds Formation, convection, turbulence, frontal, convergence, orographic; types, stratus, cumulus, stratocumulus, nimbostratus, cumulonimbus, altostratus, altocumulus, cirrus, cirrostratus, cirrocumulus.
9.	Precipitation Theories explaining the formation of precipitation; relative sizes of condensation nuclei, cloud droplets, drizzle drops and rain drops; types, convectional, frontal, orographic; forms of precipitation, dew, frost, rain, snow, sleet, hail, snow pellets, snow grains, ice pellets, diamond dust, rime.
10.	Lightning Theory of formation; associated clouds, conditions within the clouds; times, seasons and localities of occurrence.

11.	Pressure and Pressure Systems Definition; Coriolis effect; convergence and divergence; highs and lows, standard atmosphere (1013.25 mbar); isobar, isallator, diurnal pressure variation, effect of diurnal pressure variation on detection of tropical revolving storms, isobaric patterns and pressure gradients, pressure gradient, terminology, deepening or filling low, weakening or filling high, shallow (weak) pressure gradients, steep (strong) pressure gradients; patterns, troughs, ridges, cols; types of depressions, polar front low, thermal depression, vertical instability depression (e.g. tropical revolving storm); straight isobars, effect of straight isobars on wind and weather.
12.	Winds Definition, speed (knots and Beaufort scale); direction, veering and backing, calculation of pressure gradient, geostrophic wind, gradient wind, centrifugal force, Buys Ballot's law, cyclostrophic wind, effect of latitude and friction on wind speed, effect of latitude on geostrophic wind scale, absence of surface friction above 2000 feet, angle of indraught (15° at sea, 30° over the land); special wind effects, land and sea breezes, anabatic and katabatic winds, Fohn effect (chinook), gusts and squalls; monsoons, theory of monsoon formation, land and sea breezes compared to monsoons, pressure and weather characteristics associated with, monsoons in the Indian Ocean and China Sea; global systems circulation, seasonal modification and permanent pressure systems; intertropical convergence zone, trade winds, horse latitudes, westerlies, roaring forties, polar front, semi-permanent highs (Atlantic and Pacific), polar highs, Icelandic and Aleutian lows, effects of land; local winds, locality, season and prevailing direction of following winds, levanter, vendevals, mistral, bora, sirocco, gregale, etessain, khamsin, simoon, shamal, kaus, elephants, brick fielder, williwaw, harmattan, norther, tehuantepecer; upper air circulation and jet stream, thermal wind, isohypses, Rossby waves, flow patterns at 500 mbar, steering rule.
13.	Air masses Definition; source regions; identification; characteristics; modification; seasonal movement (North America and offshore); types, continental arctic, continental polar, continental tropical, maritime arctic, maritime polar, maritime tropical, equatorial.
14.	Fronts Definition; types, stationary, cold, warm, occluded; movement; sequence of weather associated with fronts, pressure, wind, temperature, cloud, weather, visibility; squall lines, definition, association with cold fronts, weather experienced with squall lines, pressure, wind, temperature, cloud, weather, visibility; areas of occurrence; local names (e.g., pampero, southerly buster).
15.	Families of Depressions or Extra-Tropical Cyclones Formation between two air masses, life cycle and movement cross section, associated weather, frontogenesis, frontolysis, secondary depressions.
16.	Waves and Swells Difference between seas and swells, definitions of period, height, length, speed, steepness, fetch; wave groups, waves in shallow water, ground swell, breakers and surf; swells in forecasting tropical revolving storms; effects of coast, currents, tide; storm surge; effect of ice on waves, ice crystals, pack ice; tsunamis and tidal waves, description, epicentre, dangers, tsunami warning system, true tidal waves and tidal bores; seiche.
17.	Oceanic Currents and Effect on the Climate Definition of set and drift, wind-drift currents, gradient currents, complex currents (including stream currents), Coriolis effect and Ekman's spiral, upwelling, permanent currents, seasonal currents; general surface circulation and offshoots in North American waters, geographical limits, seasonal variations, direction, strength; effect of currents on climate, warm, cold; knowledge of the various currents of the world.
18.	Tropical Revolving Storms Definition of path, track, vertex or cod, vortex or eye, trough line, angle of indraught, dangerous semi-circle, dangerous quadrant, navigable semi-circle; features distinguishing it from extra-tropical cyclone, small diameter, steeper pressure gradient, winds tangent to central isobars, eye absence of fronts; warnings, radio messages, projected track, unusual swell, appearance of the sky, unusual changes in wind strength and direction, corrected drop in barometric pressure; weather associated with tropical revolving storms; sources of energy; seasonal distribution; practical rules for avoidance; hurricane and typhoon anchorages; mandatory reporting; names and season for tropical storms in the following areas: North Atlantic, western North Pacific, eastern North Pacific, South Pacific, Bay of Bengal, Arabian Sea, western Indian Ocean, eastern Indian Ocean.

19.	Ice Formation and Decay Freezing of fresh and salt water; formation of land ice; Greenland and Antarctic ice caps, glaciers; ice types and egg code; types of ice, new, frazil, grease, slush, shuga, nilas, pancake, young, grey, grey-white, first-year, second-year, multi-year, fast ice, pack ice, ice of land origin, forms of floating ice (floe sizes); ice fields and their movement, icebergs and drift, iceberg routes, limits, seasons, reasons for variation in numbers, difference between northern and southern hemisphere icebergs; presence of icebergs in North Pacific, North Atlantic lane routes, International Ice Patrol; icing of superstructures, causes, fog, freezing drizzle, freezing rain, freezing spray, serious accumulation above 04; avoidance, shelter, warmer water, alteration of course and speed; mandatory reporting, freezing temperatures, high winds.
20.	Ice Detection and Reporting Ice blink, absence of sea swell, problems associated with radar, limitations due to poor visibility, liaison with shore reporting stations; receipt of ice advisory broadcasts, ice advisory service, shipping support service, interpretation of ice charts; *Ice Navigation in Canadian Waters and Manice*, ice climatology and ice operations; instrumentation, thermometers, dry bulb, wet bulb, marine screen, psychrometer, sea-water temperature bucket; barometer, units, corrections, diurnal variations; barograph; wind measuring instruments; observations and weather reports, auxiliary ship, selected ship; climatology and forecasting, purpose, avoiding damage from storms, improving passage time, holding course in fine weather.
21.	Weather Messages and Codes Knowledge of services available through *Radio Aids to Marine Navigation, Atlantic, Great Lakes and Pacific*; ability to locate marine weather forecast areas; understanding weather forecasts for the Great Lakes, ability to use MAFOR code; assorted weather fax, weather, satellite, sea-state, and ice charts; synoptic charts, surface and upper air; recognition of isobaric distribution patterns; comparison with earlier charts; knowledge of information available on weather fax in Canada and worldwide; understanding of synoptic surface analysis charts; understanding of surface progs; understanding of wave charts, analysis, forecast; understanding of ice charts; ability to forecast the following for 12-24 hours, pressure, wind, sea state, visibility, clouds, weather changes.
22.	Optimum Weather Routing Advantages, reducing storm damage, saving time, meeting special requirements; methods on board ship, through shore-based firm, through government departments; climatological routing, in areas with stable weather patterns; optimum routing, geography does not dictate track, travel time is more than three days or 1500 miles; data and long-range progs are available.
23.	Requirements Application of ship's performance curves and sea data; use of surface analysis and prog charts; use of 500 mbar constant pressure charts for estimating storm track; use of ice charts, wave charts; practical drawing of optimum tracks embracing the use of polar stereographic or gnomonic charts, ship performance curves and locus positions; factors that require a continuous updating and revision of weather routing procedures.

Note: The examination consists of a written test comprising multiple-choice and descriptive questions. Duration is three hours.

18.8A Stability

Examination number 111

Companion to Sections 14.9

ITEM	COLUMN
1.	Ship's Draft Draft and freeboard, including effect of water density and fresh water allowance; use of displacement and ton per inch / tonne per centimetre (TPI/TPC) scales to determine displacement from draft and vice versa.
2.	Terms Meaning of displacement and deadweight; buoyancy, centre of buoyancy (B) and its movement, reserve buoyancy; centre of gravity (G), including the effect of adding, removing and transferring weights; righting lever (GZ) when the vessel is heeled, metacentre (M), metacentric height (GM) as an indication of initial stability, danger of slack tanks; centre of flotation (F) and trim, and existence of trimming moment created by G longitudinal (GL) and B longitudinal (BL); meaning and characteristics of stiff and tender ships.
3.	Stability Data Use of stability data supplied to fishing vessels, allowing for the effect of water density on draft and displacement; interpreting curves of statical stability, achieving satisfactory transverse stability, achieving desired trim; effect of adding, removing and transferring weights on draft, list and trim, allowing for the free surface effect of tanks or when the fish load is carried in bulk and change of stability during the voyage; effects of reduction in freeboard on stability and the dangers of overloading; dangers due to icing effects.

Note: The examination consists of multiple-choice questions and practical calculations based on ship's stability data booklet.
Duration is three hours.

18.9 General Ship Knowledge

Examination number 158

ITEM	COLUMN
1.	Pumping Systems General pumping arrangements, bilge and ballast, valves, pumps, manifolds, bulkhead valves, strum boxes, ship side valves, sea inlets, bilge ejection valves.
2.	Ship's Data Ship's plans and specifications; arranging for minor repairs for dry-docking; effects of reduction in freeboard on stability and seaworthiness; dangers of overloading;
3.	Calculations Determination of approximate metacentric height from the rolling period using the monogram supplied in the IMO booklet, *Recommendation on Intact Stability for Fishing Vessels*; calculation of change of trim or draft from trim tables; ability to read draft and find mean draft, with or without lists.
4.	Mechanics Emergency repairs to maintain watertight integrity; different types of rudders and propellers on fishing vessels.

Note: The examination is a multiple-choice test.
Duration is two hours.

18.10 General Seamanship

Examination number 169

ITEM	COLUMN
1.	Communications Recognition and knowledge of the meanings of the lifesaving and distress signals contained in the International Code of Signals.
2.	Safe Working Practical knowledge of safe working practices aboard fishing vessels; basic knowledge of pollution prevention; knowledge of the Code of Safe Working Practices as it applies to fishing vessels.
3.	Watchkeeping Duties and responsibilities of watch members; action of the officer of the watch in emergencies at sea and in port; maintenance of a proper deck log concerning navigation progress, electronic instrument use and unusual occurrences; common steering procedures, their purpose and how to put them into effect; use of azimuth circle, pelorus or any selected method of taking a bearing; familiarity with changing over between automatic and hand steering, and emergency steering (referring to operator's manual); reading bearings and headings.
4.	Responsibility Master's responsibilities in emergencies; duties and responsibilities of the master of a small vessel as required by the *Canada Shipping Act*; practical considerations of boat handling in heavy weather, while towing and being towed, grounding, bilging, in damaged condition, channels, rivers and confined waters, berthing, unberthing, anchoring and weighing anchor, manoeuvring in close proximity to other ships; master's duties on taking over and relinquishing command; preparation of the vessel for inspection and surveys; planning the voyage.
5.	Weather Weather reports and their use; elementary knowledge of weather systems, high- and low-pressure areas and frontals.
6.	Rules Collision Regulations with Canadian Modifications 1983; Code of Nautical Procedures and Practices.
7.	Maintenance Maintenance of deck gear and structure (not including nets and other gear specific to a particular type of ship).

Note: The examination is based on the oral examinations for all previous fishing certificates. Answers shall reflect the additional experience, responsibilities and studies at this level.
The examination is oral.
Duration as necessary.